

# MECHANICS' MAGAZINE,

AND

## REGISTER OF INVENTIONS AND IMPROVEMENTS.

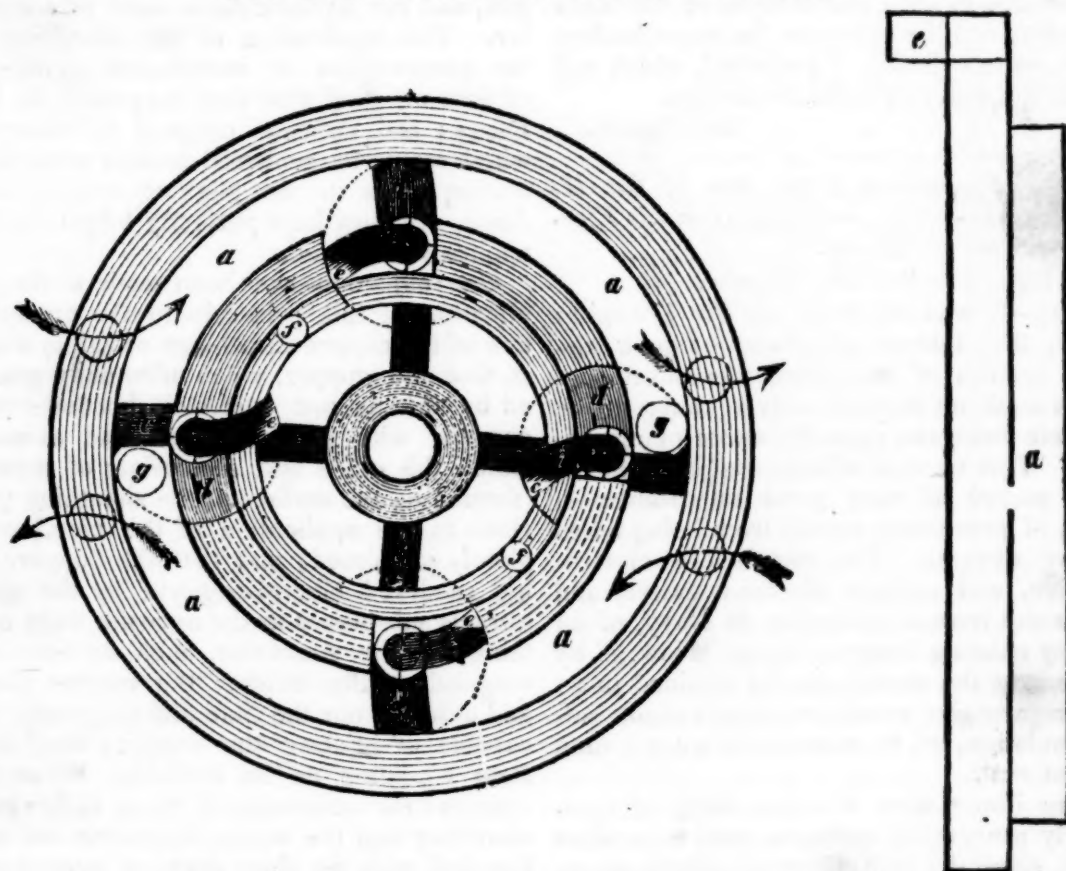
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[NUMBER 3.

"Who steals my purse, steals trash; 'tis something, nothing;  
'Twas mine, 'tis his, and has been slave to thousands;  
But he that filches from me my good name,  
Robs me of that which not enriches him,  
But makes me poor indeed."—SHAKESPEARE.

### NON-RECIPROCATING ROTARY ENGINE.



To the Editor of the Mechanics' Magazine:

SIR,—Be it known, that I, Ami Clark, of Berlin, in the county of Hartford, and State of Connecticut, have invented a steam engine, and that the following is a description thereof. *a a a a* is a circular cavity, formed principally by two concentric cylinders, of which the parallelogram *a*, fig. 2, is a sectional view; *c c* are standing blocks in the cavity, secured to the inner surface of the outer cylinder. Fig. 2, a side view of one of the four valves, marked *d d d d*, in fig. 1, which are secured to the outer surface of the inner cylinder, and form, when closed by the rollers *g g*, a part of the outer sur-

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face of the inner cylinder, as shown at the standing blocks, for the purpose of passing them with facility; *e e e e e*, figs. 1 and 2, the spanners, or keys, which, by coming in contact with the rollers, *f f*, will turn the valves, radiating from the centre, to receive the pressure which will propel them from the standing blocks, and cause them to run their circuit. Two of the valves are acted upon while two are passing the blocks, and thus twice the surface measure of a section of the cavity is acted upon continually while steam is applied.

As the steam is admitted on opposite sides at the same time, it will be seen that the

pressure, however great, will not generate friction. This engine gives no motion but circular; the advantage in this respect over the reciprocating I need not mention. It is obvious to every mechanic, that in continually changing or reversing the motion of heavy bodies there is great loss of power. It will be necessary to have two valves to one block, that the pressure may not generate friction; the more standing blocks and valves there are, the less the weight of the engine in proportion to the power. The circular cavity ought to be small in diameter, and the cylinders which form it can be made with sufficient length to acquire the surface measure requisite. The blocks may be secured to the outer surface of the inner cylinder, and the valves to the inner surface of the outer cylinder, if preferred, which will cause the outer cylinder to revolve.

AMI CLARK.

*On the Application to the Arts of Sir H. Davy's Discovery, resulting from his Electro-Chemical Theory.*

To the Editor of the Mechanics' Magazine:

SIR,—It was supposed by Sir Humphry Davy, that instead of affinity being a distinct species of attraction, two substances had a tendency to unite only in consequence of their being in opposite states of electricity. This view of affinity suggested to Sir H. a matter of very great importance—a mode of preventing metals from being acted on by oxygen. The metals are electro-positive, and oxygen electro-negative, and this is the reason, according to Davy, of an affinity existing between them. Now, if by any means the metals can be retained in an electro-negative condition, they cannot suffer oxidation, or, in common language, they cannot rust.

The importance of some mode of completely preventing oxidation must be evident to all, since the evil effects of oxygen on articles composed of metal are daily witnessed. The substance employed in rendering iron or steel electro-negative is zinc. A very small quantity of this metal applied to any article composed of iron or steel, will completely prevent the action of oxygen upon it, whether exposed to air or water. All articles of cutlery whatever, all iron, steel, or copper instruments used by mechanics, (excepting those which are exposed to fire,) all farming utensils—axes, hoes, sickles, scythes, plough-shares, chains, &c. &c. can be effectually prevented from “rusting” by the application of a very small quantity of zinc, soldered to them in any place where it could be the most conveniently done. The ex-

pense of the zinc for this purpose is exceedingly trifling. “A piece of zinc,” says Dr. Turner, “as large as a *pea*, or the head of a small round nail, was found fully adequate to preserve 40 or 50 square inches of copper—and this wherever it was placed, whether at the top, bottom, or middle of the sheet of copper, or under whatever form it was used.”—[Turner's Chemistry, p. 99. American edition.]

This brilliant discovery of Sir H. Davy's, the result of his *Electro-Chemical Theory*, was first applied to the copper sheathings of ships, which all know are very expensive, and last but a short period, in consequence of their being constantly acted on by oxygen, and the hydro-chloric acid of sea-water. The application of this discovery to the preservation of instruments composed of iron or steel was first suggested by Mr. Pepys; and delicate surgical instruments, which would be rendered useless were their cutting parts in the slightest degree oxidized, are now kept perfectly bright by the application of zinc.

One objection has been made to the application of this principle to the preservation of the copper sheathings of ships, which is, that the copper, when effectually guarded by zinc against corrosion, becomes soon covered with marine plants and animals, which the oxide and submuriate of copper, (formed on the surface of the sheathing previous to the application of the zinc,) completely prevented; and that the copper, being rendered electro-negative by the zinc, attracts substances in the opposite state contained in the sea-water, such as lime and magnesia. But neither the marine plants and animals, nor the lime and magnesia, are capable of injuring the copper; they only form a coating on its surface. When we compare the endurance of these difficulties, admitting that the above objections are well founded, with the short space of time that a copper bottom lasts, and the enormous expense of renewing the copper, they appear as nothing. Besides, it is the opinion of men of science, that by a skilful adjustment of the proportions of copper and zinc, or iron, which can be used instead of zinc on copper, these objections can be completely removed. However weighty these difficulties may be, they are confined solely to the application of zinc or iron to the copper sheathings of ships; they are not made to the application of zinc to metallic instruments.

One more advantage, and perhaps the greatest of all, arising from this discovery of Davy's, is that *iron* can be used instead of copper on the bottoms of ships, thus vast-



ly reducing the expense of sheathing. The zinc as effectually prevents any chemical action on the iron as on the copper, and hence one is as good for the purpose of sheathing as the other.

The numerous experiments which have been made by men of science since this discovery of Sir H. Davy, have fully established its value and importance, and it now remains for men to apply it to some useful purpose.

I am aware of no use having been made of this valuable discovery except in the preservation of ships' bottoms and surgical instruments; and why, I ask, do not mechanics avail themselves of its advantages? It cannot, I think, be possible for any well informed mechanic to be ignorant of any of the facts above stated. If any one is, it must be his own fault. Books are as "cheap as dirt," and if any mechanic will say he cannot buy a few books on science, and that he has no time to study books if he had them, he is poor indeed, and leads a slave's life. Such a man I sincerely pity. But what shall I say to those who *do* understand this principle—this discovery of Davy's—who do not make some application of it? Go into the workshop of the different mechanics, and see their tools undergoing constant corrosion. Go to our wharves, and see all the iron work of ships covered with rust—their anchors and chain cables covered with oxide. Go to the printing office, and see the press red with the oxide of iron—the chases and composing sticks also covered with the same. Look at the steam engine, the most ingenious, useful, and probably the greatest of all inventions, and think whether Sir Humphry Davy's discovery could not be applied to that.

Wherein is the world benefitted by any discovery, if no application be made of it? To what purpose do we rack our brains in acquiring knowledge, if we make no use of it when obtained? People seem afraid to adopt any thing new. Any new invention or discovery, if it be ingenious, they view with delight; but the thought does not seem to occur to them whether it can be applied to any useful purpose; and if any one attempts the application of a new principle, be it what it may, there are thousands ready to laugh at him, as they did at Fulton, in his exertions to show to the world the use and value of that machine of all machines—the *Steam Engine*.

Ships are constantly building and being coppered, without the least regard to this invaluable discovery; and why is it? Are shipbuilders and shipowners ignorant of the

existence of this cheap and effectual preventive against the ravages of the elements, or have they tried it and found it ineffectual? If they have, I am not aware of it.

If any of the correspondents of the Magazine will point out any thing new on this subject, many of whom probably can, I, for one, should be highly gratified. A.

We have just received information from a friend, who has been on a visit to Livingston county, that he saw in operation on the Genesee Flats, near Moscow, a machine working by horse power, which, with the assistance of one person and a pair of horses, can cut down from fifteen to twenty acres of wheat in a day. The wheat as cut is received on a platform; and connected with the machine is a revolving rake, which takes off the wheat and leaves it in heaps of proper size for binding into sheaves, and it keeps eight men busily employed in binding them up. We shall endeavor to get a drawing and particular description of this machine for our next number.—[ED. M. M.]

*A Map of the Railroads and Canals in the United States, with a Concise Description of each.* By D. K. MINOR, Editor of the Railroad Journal. 18mo. pp. 72. New-York, Minor & Challis.

Prefixed to the description which accompanies this valuable map is one of those plain, intelligent, and concise introductions, (the *multum in parvo*), which are ever found at the commencement of works of standing merit, and which in most cases induces us to place great reliance on the correct manner in which a work is got up. The author asks for information of "important or even trivial errors" which may be discovered in the work. It is thus and thus only that the scholar and the philosopher can arrive at true knowledge; and if we mistake not, it is by such a course, combined with undeviating perseverance and integrity, that our author has elevated himself from one of the working classes to be one of the most influential disseminators of useful knowledge in the United States.

His observations generally are worthy of an attentive perusal, and are of the deepest interest to our citizens, none more so than where he speaks of a "Steamboat Canal from the Hudson to Lake Ontario, thence round the Falls of Niagara, and thence from Chicago to the navigable waters of the Illinois river." He states, "this is a work,

or rather these are works, which will be accomplished, and become to this Union the CABLE of safety, while other works stand as the rigging of the ship ;” and his concluding remark is well worthy of observation, and predicts what we trust will be fulfilled to the letter, and *that* long before the allotted time is expired, namely, that another quarter of a century will accomplish more than is marked out in this map. We find there are descriptions of 93 Railroads, and a valuable account of 17 more ; also, a particular account of 49 canals, making together an account of 159 railroads and canals, and all comprised in 72 pages, realising the story of Homer’s Iliad contained in a nut-shell. It is well drawn and engraved (by Mr. W. Norris) ; the rivers and mountains are plainly delineated, and the places through which the railroads and canals pass distinctly portrayed, distinguishing those *finished, making, contemplated, and chartered* ; and in the margin are valuable graduated profiles of most of them.

A romantic view of the Erie Canal at the Little Falls forms a beautiful vignette to the map.

If civilization increases by communication, the speedier and easier it be made, either by land or water, the better. Thus the United States, by means of her railroads and canals, will attain the highest perfection of civilization in the world—her treasures will be easier collected ; and, it must be admitted, that as civilization increases, so does knowledge. “Knowledge is power,” and as Dr. Birkbeck has well expressed, “it is also wealth, and security—enjoyment, and happiness ;” it becomes at once a guide to that “temple which is not made with hands, eternal in the heavens.” Entertaining these opinions, we most cordially recommend this map to our readers, as one means of promoting an object so “devoutly to be wished for.”

J. K.

sician, and his drudge the apothecary, can here be supplied ; and with the chemist, can search Nature in all her departments, whether animal, vegetable, or mineral. The doctor seems to have collected her varied treasures in them all, and have ransacked air, earth, and water, for them. His catalogue comprises upwards of 1450 articles, of which there is an extensive stock of chemical preparations, mostly manufactured by himself, or of European importation by him, during the space of four years, which time he has carried on business in this city.

The doctor is well known to us as a very able and scientific chemist, and has contributed some very excellent articles thereon to several of our leading scientific journals. His remarks on arsenic, with drawings of the color of its precipitates, formed by reagents applied to them, communicated to the American Journal of Science and Arts, vol. 19, No. 2., is ably written, and was much commended ; so were his several papers on the ore of platinum, on gold, on mercury, and on amber, inserted in the Magazine of Useful and Entertaining Knowledge, published in 1831 in New-York, all proving that he not only possesses theoretical, but practical knowledge : such a one as can assist the scholar and the mechanic in their several labors. To such we recommend the doctor and his catalogue, which is very clearly and scientifically arranged, and well classified, so that at a glance each can see what is wanted, and thereby save much valuable time. We anticipate we are not doing wrong when we recommend a scientific man, and yet a practical one, to the mechanics as a tradesman. It is such a one they want, for mechanics and chemistry ever go hand in hand together, though chemistry may be the elder sister, for Tubal Cain, according to the Mosaic history, first taught the art of extracting iron and copper from their ores. T.

**A Complete Catalogue of Drugs, Chemicals, Varnishes, Perfumery, Apparatus, Instruments, Tests, and every Article used by Physicians and Apothecaries, Theoretical and Practical Chemists, Lecturers on Natural History and Philosophy, and Mechanics applied to the Arts.** By Dr. LEWIS FEUCHTWANGER, 377 Broadway. New-York, 1834, pp. 12.

This very ample catalogue, filling 12 octavo pages, comprises all that the most scientific scholar may require in the pursuit of knowledge, and all that the mechanic may want to carry the most abstruse theory into practical demonstration. The phy-

**Observations on the Epidemic now prevailing in the City of New-York, called the Asiatic Spasmodic Cholera, with Advice to the Planters of the South for the Medical Treatment of their Slaves.** By CHRISTOPHER C. YATES. Second edition, 1832, pp. 57. New-York, Collins & Hannay.

No work is more acceptable at the present time, when the cholera is again raging around us, than the above able observations made from experience aided by science, and we trust our readers, if they have not read it, will procure one at once ; and if they are fortunate in having one in their library, we recommend a re-perusal thereof, for it will



tend to dissipate the alarm which epidemics always engender, as also point out the plainest and most simple mode of cure, namely, "by removing as speedily as possible the offensive matter from the stomach and intestines, in the manner that Nature indicates by her perhaps too feeble efforts, vomiting and purging, and allaying the spasmodic affection by anodynes." The author states that by this course of practice no case proved fatal under his care. Subsequent experience since 1832 has confirmed his views; and though he expresses a fear of being called mad by those who, (as in 1812 and 1813, the period of the "Winter Fever," and in 1822, the season of the Yellow Fever,) differ with him, yet his fears have not been verified; but, as before stated, experience has confirmed his practice. The present Board of Health here have adopted his advice of making a daily report of deaths only, and we trust his brother physicians will adopt his course of evacuants. To the mechanic we should say, read attentively that part of the work on diet and drinks in reference to epidemic cholera. The author there prefers salt to fresh meat, ale and porter to spirituous or vinous liquors, and we wish all of them may follow this advice; and then, as the doctor states, he will be enabled to return to his toil with a light heart, a cheerful countenance, and vigorous muscle.

The pamphlet contains most excellent and scientific observations on the nature and cause of the disease, from the commencement to the conclusion thereof, and it finishes with an able epitome of the opinion and practice of the most eminent among the Medical Faculty of Paris, founded on the report of the cholera at Paris.

After reading this work, the name of cholera, (which has proved here and in Europe more epidemic, infectious, and dangerous, than the disease itself,) will no longer be a bugbear to frighten our artisans from their peaceful labors, and drive trade from our shores. In 1832 the work was much read, and we now, in 1834, recommend the author to favor us with another edition. It has done, and will yet do, more good, by dissipating groundless alarms and gross medical errors, alias experiments. There is no quarantine here yet as to the disease, and the Board of Health report deaths only, both of which are advised and written on by the author, therefore his advice of 1832 is now followed in 1834, and is our reason, amongst others, for advising him to publish another edition. We know it will repay him, even by the purchasers from amongst the mechanics.

T.

## MECHANICS' STATE CONVENTION.

*Proceedings of the State Convention of Mechanics, held at Utica, August 21-22, 1834, for the purpose of taking into consideration the Effect produced on the Various Mechanical Trades by the Present System of State Prison Discipline.*

The Convention of Mechanics, on the subject of State Prison Monopoly, assembled at the Court House in Utica, on Wednesday morning, August 20th, 1834, when JOHN MEADS, of Albany, was chosen President pro tem., and ROBERT TAYLOR, of New-York, and J. O. COMSTOCK, of Schenectady, Secretaries pro tem. It was then

Resolved, That the credentials of delegates be now presented and called, which being done, ninety delegates answered to their names.

It was then, on motion of Mr. J. P. Simpson,

Resolved, That a committee, to consist of one delegate from each county represented in the Convention, be appointed to select and nominate a President, two Vice-Presidents, and two Secretaries, as permanent officers of this Convention, and that said committee be instructed to report at the opening of the Convention this afternoon. Whereupon the following gentlemen were appointed said committee: Austin Baldwin, David Anderson, Alexander Gray, R. M. Carrington, Joseph Stillman, W. E. Lathrop, John Richardson, Warren Hecox, Earl D. King, Rudolph Snyder, Ira Tillotson, Francis Collingwood, Lewis S. Ayres, Farnham White.

The Convention then adjourned to meet at 2 o'clock, P. M.

### AFTERNOON SESSION.

August 20, 1834.

The committee appointed to nominate permanent officers, reported the following, viz.:

RUDOLPH SNYDER, of Utica, President; ANSON BAKER, of New-York, and FREDERICK STARR, of Monroe county, Vice-Presidents; ROBERT TAYLOR, of New-York, and RICHARD HOGARTH, of Ontario county, Secretaries.

On motion, the report was accepted, and these gentlemen being unanimously elected, took their seats.

A letter was then read, addressed to the President of the Convention by B. Birdsall,\* of the New-York delegation, who could not

\* This letter was either not handed to the Committee of Publication, or has been mislaid; and therefore is not published.

attend, which was ordered to be placed on the minutes of this Convention.

On motion, the Central Corresponding Committee of Oneida county were invited to take a seat in this Convention, and a committee of two, Mr. King and Mr. Russ, was appointed to wait on them and inform them of the resolution.

A communication from Mr. Waydell was read, and, on motion by him, laid on the table for further consideration.

Mr. Baldwin offered the following resolution, which was adopted :

Resolved, That a committee of ten be appointed to draft an Address and Resolutions setting forth the views of the Mechanics of this State with regard to the existing State Prison Monopoly. The resolution being adopted, the following gentlemen were appointed to constitute the committee, viz. : Robert Taylor, Richard Hogarth, Edward Mead, John Mead, Nathan D. Sherwood, Arden Seymour, D. K. Minor, J. O. Comstock, Bill Colby, John Richardson.

Mr. Elbert J. Willet, a delegate from Lansingburgh, presented his credentials and took his seat.

A communication was received from the Utica Mechanics' Association, tendering to the members of the State Convention of Mechanics the use of their reading room, and such other attentions as may be deemed necessary and proper.

The Committee on Address and Resolutions retired, whereupon Austin Baldwin was appointed to act as Secretary until their return.

#### EVENING SESSION.

August 20, 1834.

The Convention having been called to order, Mr. T. Thompson, of Trumansburgh, presented his credentials and took his seat. Mr. Thompson then presented two resolutions, passed at the meeting by which he was appointed, which were read and laid on the table.

Mr. Abner Cutler was admitted as a member from Buffalo.

#### MORNING SESSION.

August 21, 1834.

The President took the chair, when the roll was called and the minutes of the preceding evening read. A letter was received and read from the absent members of the Buffalo delegation, which was, on motion, referred to the Committee on the Address and Resolutions.

The credentials of the Troy delegation were read, whereupon they were admitted and took their seats.

On motion, Resolved, That a Central Committee be appointed at Utica, as a Committee of Correspondence. The following gentlemen were appointed to constitute that committee, viz. : Rudolph Snyder, Ephraim Hart, E. Wells, Harvey Barnard, Augustus Hurlburt, and Riley Rogers.

On motion, it was then Resolved, That the following gentlemen be appointed to act as a Corresponding Committee for each county, viz. :

*Kings*—Samuel S. Powell, David Anderson, Brooklyn.

*New-York*—Joseph P. Simpson, Anson Baker.

*Westchester*—Frs. Kain, Stephen Ward.

*Albany*—John Meads, Samuel S. Steel.

*Rensselaer*—E. J. Willet, Lansingburgh ; Lyman Garfield, Troy.

*Schoharie*—J. S. Bonney, Austin Knowles.

*Niagara*—Elliott Lewis, Lockport.

*Dutchess*—Jas. Mills, Poughkeepsie ; A. A Comstock, Stamford.

*Schenectady*—Alfred Stillman, John Allen.

*Saratoga*—Nathan D. Sherwood, Waterford ; Moses Williams, Ballston Springs.

*Washington*—John Adams, Salem ; John Horton, Union Village.

*Oneida*—Arden Seymour, Rome ; Thomas Williams, Vernon.

*Cortland*—Harman J. Short, David Coy, Homer Village.

*Steuben*—James May, Thomas Thompson, Bath.

*Warren*—Sheldon Benedict, John A. Ferris, Glens Falls.

*Tioga*—Gideon O. Chase, East Jury District ; Wm. R. Judson, West Jury District.

*Tompkins*—Otis Eddy, Almanzer Tufts, Ithaca.

*Cayuga*—Daniel Hewson, Curtis Stevens, Auburn.

*Onondaga*—Edward B. Wicks, George W. Parsons, Syracuse.

*Erie*—J. W. Beals, E. D. Efner, Buffalo.

*Ontario*—Richard Hogarth, Geneva, Earl D. King, Canandaigua.

*Chenango*—Truman Enos, Morris ; L. R. Hopson, Sherburne.

*Broome*—Lewis Pratt, E. W. Dewey, Binghamton.

*Oswego*—Wm. C. Rogers, Elisha Carrington, Oswego.

*Yates*—A. H. Bennet, J. F. Terrill, Pen Yan.

*Seneca*—Daniel Pomeroy, Ovid ; Henry S. Lysk, Waterloo.

*Wayne*—Erastus Burt, Stephen Dunweil, Newark.

*Genesee*—Chauncey Kirkham, Batavia ; Newman Ferris, Leroy.



**Livingston**—J. B. Hall, Samuel Gardner, Genesco.

**Monroe**—John Watts, Wm. E. Lathrop, Rochester.

**Orleans**—Wm. Wood, Albion ; Wm. P. Hopkins, Medina.

**Otsego**—J. R. Worthington, Cooperstown.

**Herkimer**—Ezekiel Morris, Wm. Lomis, Little Falls.

Resolved, That the Central Committee be requested to fill all vacancies in the several county committees.

The Committee on Address and Resolutions made their report, which was accepted. The Address and Resolutions being read, were unanimously approved and adopted.

Resolved, That a Finance Committee be appointed to provide means to defray the expense of publication ; whereupon a committee was appointed.

Adjourned till 2 o'clock.

AFTERNOON SESSION.

August 21, 1834.

The finance committee reported that each member of the Convention pay one dollar to defray expenses. The report was unanimously adopted.

It was then

Resolved, That the President of this Convention be Treasurer of the same.

Resolved, That the Central Committee be instructed to have printed any number that they may deem proper of the Address and Resolutions, not less than 5000 copies.

Resolved, That the several corresponding committees of counties that have been appointed, be requested to take measures to ensure the appointment of corresponding committees in counties adjacent to theirs, as soon as possible after their return home, and have their names sent on to the Central Committee at Utica.

Resolved, That the names and occupations of the delegates present be annexed to the Address and Resolutions.

Resolved, That the resolutions lying on the table, not acted upon, be considered as withdrawn.

Resolved, That the Central Committee be instructed to furnish to each member of the next Legislature, and the Governor, a copy of the proceedings of this Convention.

Resolved, That the communication of Judge Morse, and all other communications, be referred to the Central Committee.

A vote of thanks was then passed to the Select Committee of the Assembly of this State, of which the Hon. Charles Humphrey was chairman : also, to the Mechanics' Association of Utica, for the tender of the

use of their Reading Room and other civilities to members of the Convention during their stay in the city ; and also, to the venerable President and other officers, for the satisfactory manner in which they have performed the duties devolving on them.

The convention then adjourned at 4 P. M.

(Signed,)

RUDOLPH SNYDER, President.

ANSON BAKER, } Vice Pres'ts.

FREDERICK STARR, }

ROBERT TAYLOR, } Secretaries.

R. HOGARTH,

August 21, 1834.

ADDRESS AND RESOLUTIONS.

The Convention of Delegates, from the several counties of the State of New-York, assembled at Utica, on the 20th day of August, 1834, have candidly, deliberately, and extensively examined the present *State Prison* system of this State, and submit the following as the result of their investigation :

The system of employing the convicts in our prisons, at mechanical branches, (as at present pursued in this and several other States,) does not accomplish either of the objects had in view by those who established and approved of our criminal code. Laws were established for the *punishment* and *prevention* of crime, and the reformation of the criminal ; when, therefore, the property of individuals has been plundered—when the incendiary has fired the building of his neighbor—when the seducer and the ravisher have committed crimes disgraceful and disgusting to human nature—and when the ruffian has deprived his fellow-being of life—justice demands that the punishment of persons committing such offences should be commensurate with their crimes. The safety and happiness of the community require that the punishment should be of such a nature as to deter released criminals, and others, from committing crime. Does the present prison system of this State accomplish either of those objects ? We answer No ! and will now endeavor to prove, by reason, and the testimony of competent witnesses, that the present system does not inflict sufficient punishment—has but little tendency to prevent crime, or reform criminals—that it imposes an unjust and pernicious tax on mechanics, and is degrading to their character.

1. *The present Prison System of this State does not inflict sufficient punishment for crime.* Imagine a case, (and there are many such,) of a man whose debauchery and crime have

enfeebled his body, impaired his constitution, and prostrated the faculties of his mind, until he is unfit for business, and therefore prepared to drink the dregs of the intoxicating cup, and to commit depredations upon his honest neighbor. In this stage of his existence, the emaciated, loathsome, and guilty wretch is apprehended, committed, convicted of crime, and sent to the State Prison to be *punished*. Now, fellow-citizens, prepare yourselves for the melancholy, heart-rending tale of the *punishment* of this being, who has for a series of years stifled the convictions of conscience, and grossly violated the laws of his God and his country. Thus is he punished: Arrived at prison, a physician attends him; medicine is administered; he is furnished with wholesome food and comfortable clothing; by degrees he recovers; he learns a trade; (perhaps he is released before the term for which he was sentenced has expired,) and comes out of prison a sound man. Now we ask, during what portion of the time he was imprisoned was he *punished*? Did the physician punish him by restoring him to health? Was wholesome food and comfortable clothing, (without any anxiety on his part to procure them,) a *punishment* to him? If so, would to heaven every honest mechanic might be *punished*! then they would have (what they cannot always procure by honest industry) a physician when there is need—food and clothing at all times. Talk of *punishment*! Look at the poor, honest, but unfortunate debtor in prison; contrast his situation with that of the convict in your state prisons, and you will, you *must*, admit, that the situation of the debtor is far less comfortable than that of the criminal. It may be said that an extraordinary case has been cited. We reply—select any case you please, and you cannot make it appear that the system is what it should be—that it is what it pretends to be. No! “From a mistaken philanthropy, the system of our prison discipline has been so mellowed down, that our prisons ought to be now considered as asylums for the unfortunate, rather than places of punishment for the guilty; and it may be fairly presumed, that, in many cases, their inmates enjoy what they never did before—a comfortable home; and instances have not been wanting, in which those whose term of service had expired, have committed new crimes for the express purpose of being able to return to these homes.” And it may be safely asserted, that the situation of criminals in our State prisons is no worse than that of persons barely *suspected* of crime, or the inmates of our county poor-houses, whose

only crime may be poverty or disease. We conclude our remarks on the *punishment* inflicted, with a quotation from the Report of the Hon. Charles Humphrey, made to the Assembly of this State at its last session. “It is worthy of observation,” says Mr. Humphrey, “that in most instances, both in the old world and in the new, the criminal codes have been gradually assuming a character less sanguinary, and less severe. The latter observation is undoubtedly applicable to this state; and it is a serious matter of inquiry with some of our most enlightened citizens, whether the indulgence of a supposed feeling of humanity, on the part of many, has not degenerated into a morbid sensibility, that would consult the interest and well being of the criminal, at the expense of the community against whose rights he has offended. The idea of coupling rewards and immunities with punishment has, in some instances, found its way into our statute books. It is, in the estimation of your committee, of a doubtful policy. It is questionable whether every indulgence to a convict, beyond a mere wholesome supply of his natural wants, is not *detracting* so much from the efficacy of his punishment.”

2. The present system has but little tendency to prevent crime, or reform criminals. It is a well known fact, that the prisoners lay plans, (nor can they be prevented, while suffered to work together,) and make arrangements for future depredations; they can at times converse together; they can, and do, give the significant look, the informing nod, the knowledge-conveying wink, the assenting bow; and instances are not wanting to prove, that many agreements made in prison have resulted in loss of property to honest men, after the prisoners have been released. The records of every criminal court in our State show that crime is increasing; and that many persons are sentenced to our State prisons who have been inmates of the same prison before; some of them two, others three, and others four times. Talk of reform! Hear what the Honorable Richard Riker, Recorder of the city of New-York, has said on this subject: “There are not more than *two*, out of an *hundred*, of well attested instances of reform. At every court of the General and Special Sessions held in our city, with few exceptions, several old offenders, who have been before sent to our penitentiary, or State prison, or to the State prison of some other State, are again tried and convicted.”

Mr. Humphrey, in his Report, says, “The fact may be alluded to, that most of our State prison convicts are originally dishonest and



unprincipled men, destitute of a sense of moral rectitude ; and that therefore in many, if not most instances, discharged prisoners, even if not compelled by necessity, will from choice resume their practices of depredating upon society. This fact is abundantly proved, by the vast number of instances in which these men are found a second, and even a third time, the tenants of the same, or of some other prison."

3. The present system imposes an unjust and enormous tax on mechanics, and is degrading to their character. It is said, that none of the citizens of the State are taxed for the support of prisoners : "the prisons support themselves." It is true, that mechanics are not called on to pay money to defray the expenses of the prisons ; but articles manufactured in the prisons are sold in almost every city, town, and village, in the State, at prices from 40 to 60 per cent. below what the honest mechanic, *who supports himself and family*, can afford them for ; and the consequence is, that hundreds of mechanics are thrown out of employ, and, in many cases, their families are reduced to beggary. This is no picture of the imagination. No ! it is a melancholy solemn fact. The State government, to which we look for, from which we have a right to expect, and whose duty it is to afford, protection to the interest of the virtuous and industrious mechanic : that government, which, had it acted justly, would have acted according to the truly republican maxim—"for the greatest good to the greatest number,"—either from mistaken views of economy, an unwillingness to suspend the operation of a favorite theory, or want of that information which experience and observation have now finished, rather than intentional injustice, has compelled the mechanics of the State to bear all the burthen of State prison expenses, and suffer the loss of the many thousands of dollars which now go into the pockets of the hordes of State prison contractors, agents, and sub-agents. Shall we be impudently told, that the power which should protect us has a right to destroy us ?—that it is just to impose on *mechanics* a prison system calculated to drive them to desperation, crime, and beggary, to exonerate the people from equal taxation, and to preserve untouched the public treasury ? But, fellow-mechanics, you not only suffer in a pecuniary point of view : your character is degraded. Many branches of mechanical business being carried on in the prisons, the moment a journeyman offers himself for work in a place where he is not known, he is subjected to "humiliating and

degrading inquiries and comparisons," and "to a scrutiny which an honorable man could not be expected patiently to endure." Here again we refer to the able Report of Mr. Humphrey, in which he says, "If it (the prison system) does not actually break up the establishment of the citizen, it compels him to labor for a bare subsistence ; and it is not to be wondered at, if blighted prospects and disappointed hopes have, in the end, a deleterious effect upon the habits and morals of a discouraged and desponding man." Again, "State prison convicts are, in most instances, men destitute of capital ; if, therefore, they attempt to pursue without, the trade they have acquired within the prison walls, it must be in the capacity of journeymen ; and they must, consequently, if employed at all, labor side by side with honest and respectable mechanics. When honest men associate with rogues, the very connection reduces the character of the former down to the standard of the latter ; it can never have the effect of raising the reputation of the rogue to that of the honest man, in the estimation of the world. Suppose a respectable farmer or other citizen should send his son to some mechanic to learn a trade, and on visiting him at his workshop should find him seated by the side of a discharged convict : might he not justly complain ? Would an honorable minded man, under any circumstances, consent that his son should be subjected to the contaminating influence of such an association ? His faith in the reformation scheme must be strong indeed, who would hazard the morals of his son in such company."

The contempt and degradation necessary and consequent on a competition between our virtuous citizens and condemned criminals, is a subject we would fain have passed in silence ; but it is the most disgusting feature of the system. If asked, what remedy we propose for the evils we complain of, we might answer, that the evil once fully admitted, the collective wisdom of our statesmen will easily provide that remedy, without resorting again to any of those sanguinary modes of punishment which the penitentiary system was intended to supersede. Solitary confinement, for a shorter period of time than the usual term of imprisonment, with an entire abandonment of the practice of pardoning or reprieving, is the plan which seems, in our opinion, the best calculated to produce the desired effect. Or, if the labor system must be continued, which we by no means desire, the convicts may be employed in the construction of roads, canals, or other public works, which,

while they contribute to the general benefit of the whole community, will not operate as an unjust and unequal tax upon a part. But we will not attempt an elaborate view of this part of the subject; the necessary limits of this address precludes the possibility of doing more than thus briefly to allude to some of the most prominent and feasible plans which have been proposed.

Fellow Mechanics of the State of New-York, we call on you as men, as citizens, and as mechanics, to assert, demand, and maintain your rights. Too long have your usefulness and influence in society been neglected; too long have you suffered under the present unjust, injurious, and blighting prison system. Arise, therefore, in your might, and, through the ballot boxes, speak a language *not to be misunderstood*. Select men who, to whatever *political* party they may belong, will use their best exertions to destroy this *Hydra of Iniquity*; men who, while they provide for the punishment and reformation of criminals, will at the same time guard and secure the rights of the honest and industrious citizen. We are not unreasonable in our demands; we ask only for justice; and we are satisfied that, when the evils that result from this system, and of which we complain, are known, all classes of society will see and admit the justness of our claim, and we shall obtain redress.

We also call especially upon the *agricultural* part of the community, to step forward and aid us in remedying this evil. They are alike interested with us in sustaining the industrious mechanics of the country, who compose, with the farmers, the *bone and sinew* of the community. They are alike dependent upon the mechanic, as the mechanic upon the farmer. If, therefore, the mechanics are prostrated by this, to them, *ruinous* course of measures, will not the farmers be prostrated also? If the mechanics are driven to agricultural pursuits, is it not easy to perceive that the loss which will be sustained by the farmer, in the reduced price of his produce, and the diminished value of his real estate, will exceed, by an hundred fold, the paltry sum which he may save in the price of articles manufactured by *state prison convicts*? Is it not, therefore, we again repeat, as much for the interest of the farmer, as of the mechanic, that all improper interference with regular business should be avoided? We think it is; and with this belief, we confidently call upon every farmer to aid us in electing such men as will protect *our* rights and *their* rights. To our fellow citizens of other professions, we

would appeal in the language of the Hon. N. B. Morse, judge of the Criminal Court in Kings county, who says:

"The rule, that 'we should do unto others as we would that others should do unto us,' is one of the soundest morality; and the oftener it shall be inculcated, and the more it shall be acted upon, the more elevated and honorable will be the tone of public sentiment.

With this rule of moral honesty before them, let the question be put to men of wealth, ease, and affluence, whether they would like to have the State prison turned into a school, where the convict should be taught the elegant accomplishments of fashionable life, that, on his return to society, he may be qualified to mingle in the drawing room with *their* sons and *their* daughters, and perchance to improve his condition by marriage with an heiress of their fortune?

Let the man of wealth say, whether he would be willing to receive the convict as the dancing or music master for his sons or his daughters? Let him say, even, whether he would receive him as his cook or his coachman, however well he may have learned these ornamental or useful arts in the State prison?

Let the lawyer, the divine, or the physician, say, whether accomplished lecturers in the learned professions ought to be procured for the prison, to supply the world from such a seminary with the men who are to watch over the rights and property of men—to enlighten the morals, and prepare their souls for a better world—or who are to remove the physical maladies of our nature?

Let the merchant say, whether the convicts should be taught book-keeping, and the various other branches which are to fit them for the counting room or the counter, to be sent back for employment to the mercantile community; whether he would like to trust his keys, his books, or his goods, to such men; whether he would consider the educated convict as a suitable companion for his sons or his clerks?

An affirmative answer to these questions would be revolting to the moral sense of the community. Then wherefore inflict upon mechanics that which, when applied to ourselves, would not only raise the sigh of regret, but would arouse our utmost resentment? Surely, the justice of the community cannot be appealed to in vain.

The universal consent of mankind has long conceded to the mechanics and farmers that 'they are the bone and sinew of the community.' And it is no less true, that no whole class of the people, in towns and vil-



lages, combine a greater share of intelligence, morality and patriotism, than the mechanics; probably by no means an equal share. And if the wealthy and the learned are not to be thrown in contact with the criminal from the State prison, why, by what rule or right, should the mechanic?

The first and more obvious evil is, that the labor of the convicted villain and lawless marauder is put in competition with that of the regular and honest mechanic. The convict is only to be supported by—barely to subsist upon—his labor; and if he does not even earn a subsistence, the public makes it up; while the mechanic with his family, who has an honest right, not only to a livelihood for himself and them, but to save from his earnings the means of education for his children, and comfort for himself in old age, is compelled to compete with this system, which rewards crime by learning the criminal a good trade, or give himself up to hopeless indolence and consequent degradation. This species of competition has been compared sometimes with that between free and slave labor, which is said to be very unequal, but which is far more advantageous to the free than this competition to the mechanic, for the slave is to be supported both in helpless infancy and declining age; whereas, the convict usually both commences and ends his labor as an apprentice or journeyman to the State, in the prime and vigor of manhood.

The next, the more dangerous and degrading evil of the system—more dangerous for being more secret and insidious—is, that when these well-instructed mechanic convicts are released from their service to the State, they are enabled to seek employment in the work-shops of the regular mechanic, and there taint the morals of those who are training for honorable and useful life, or cover the most enormous offences with an industrious application to business, and seeming honesty of deportment. The people of Brooklyn have witnessed a near, if not an exact parallel to the latter case, in the course of the notorious Smith, who afterwards robbed the City Bank of New-York.

Will not every class of men arise upon this subject, and aid the mechanic in his endeavors to obtain redress? Let it not be said that the mechanics are left to contend for justice upon this subject alone, but let the spontaneous voice of the whole community call for the requisite reformation. Let all act upon the glorious rule, that 'as we would others should do unto us, even so will we do unto them.'

We call on every citizen of the State,

whether mechanic, agriculturist, professional—or be his situation or occupation what it may,—to come forward and assist us in the struggle for the destruction of the detestable monopoly of which we complain. We ask, is not a community of hardy and virtuous citizens preferable, to the State, to one of convicts and paupers? We are sensible you will answer in the affirmative; and we therefore confidently appeal to you to adopt and support the following resolutions:

Resolved, That the system pursued at present in our prisons is an infringement of the rights, and an insult to the feelings, of the mechanics of our State; that their rights are trampled on, and their character degraded, by competition with this infamous monopoly of convicts and malefactors.

Resolved, That this system of oppression is of such a nature as ought not quietly to be borne by any set of people worthy the name of freemen.

Resolved, That the object of all just government and righteous laws should be the protection of the virtuous in their lawful occupations, and to punish, and endeavor to reform, the vices of the guilty.

Resolved, That the present prison system operates as a punishment to the virtuous, as a premium for crime, and a reward to the guilty.

Resolved, That we recommend to all our brother mechanics, of every trade, that, at the coming and all future elections of members of the Legislature, they vote for and support those and those only who will oppose this monopoly; that to such we will give our whole influence, and that we will use all honorable means to promote their election.

Resolved, That the mechanics in every city, town, village and hamlet, in our State, be requested to form themselves into associations, in support of the above views, and in opposition to the present prison system.

Resolved, That we will pursue this subject with unabated zeal and untiring perseverance, till justice be accorded to our claims; and we recommend that a Convention be annually appointed, to meet at Utica on the third Wednesday of August in each year, until we obtain redress: the delegates to be chosen from every county in the State, in a ratio of triple the number of members to the Assembly of the State.

#### NAMES OF DELEGATES, &c.

##### NEW-YORK.

Anson Baker, Silver Plater.  
Joseph N. Barnes, Marble Cutter.

Joseph P. Simpson, Tin Plate Maker.  
 Paulus Hedl, Blacksmith.  
 Robert Taylor, Cooper.  
 William Hall, Piano Forte Maker.  
 Austin Baldwin, Plane Maker.  
 John Waydell, Cooper.  
 Jacob Day, Lock Smith.  
 Cornelius S. Van Winkle, Printer.  
 Alexander Masterton, Stone Cutter.  
 John Anderson, Stone Cutter.  
 Edward Smylie, Brass Founder.  
 Daniel C. Pentz, Cooper.  
 Thomas Simms, Hatter.  
 Daniel Berrien, Brush Maker.  
 Joseph Oatwell, Marble Cutter.  
 D. K. Minor, Printer and Publisher.  
 Stephen Kingsland, Builder.  
 William Eagleson, Marble Cutter.

## KINGS COUNTY.

David Anderson, Brooklyn, Stone Cutter.  
 William McDonald, do. Cooper.  
 Daniel S. Burdett, do. Comb Maker.  
 Samuel S. Powell, do. Tailor

## RENSSELAER COUNTY.

E. J. Willet, Lansingburgh, Cordwainer.  
 Lyman Garfield, Troy, Cordwainer.  
 Arthur Millikin, do. Blacksmith.  
 Elias Ross, do. Silver Plate Maker.  
 Uri Gilbert, do. Coach Maker.  
 Harvey Warner, do. Builder.  
 Richard Freeman, do. Mason.

## ALBANY COUNTY.

John Meads, Albany, Cabinet Maker.  
 Alexander Gray, do. Stone Cutter.  
 William Hawe, do. Cooper.  
 Wynant Crannell, do. Tailor.  
 Jeremiah Osborn, do. Cordwainer.  
 Lemuel L. Steele, do. Brush Maker.  
 Lewis Farnham, do. Carpenter.  
 Corns. Vanderbelt, do. Coach Maker.  
 John Iggott, do. Tin Plate Worker.  
 David Benson, do. Plane Maker.

## SARATOGA COUNTY.

Robert M. Harrington, Saddle and Harness Maker.  
 Nathan D. Sherwood, Hatter.

## TIOGA COUNTY.

Francis Collingwood, Elmira, Silversmith.  
 William R. Judson, do. Saddler.  
 S. J. Leach, Owego, Watch Maker.  
 Gideon O. Chace, do. Cabinet Maker.

## SCHENECTADY COUNTY.

Richard M. Cook, Schenectady, Tailor.  
 Stephen Traux, do. Cordwainer.  
 John O. Comstock, do. Hatter.  
 Joseph Stillman, do. Machinist.

## ONEIDA COUNTY.

Alfred Munson, Utica, Burr Stone Manufacturer.  
 Ephraim Hart, do. Iron Founder.  
 Rudolph Snyder, do. Cabinet Maker.  
 John Reed, do. Plane Maker.  
 Augustus Hurlburt, do. Chair Maker.  
 Elisha Wells, do. Cordwainer.

Edmund W. Blake, do. Tailor.  
 Joshua Hardway, do. Saddler.  
 George Tharp, do. Silver Plater.  
 Elijah W. Roundey, do. Cooper.  
 Samuel A. Sibley, do. Coppersmith.  
 John S. Peckham, do. Plough Maker.  
 Harry Bushnell, do. Blacksmith.  
 John A. Russ, do. Carpenter.  
 Isaac G. Stratton, New-Hartford, Cabinet Maker.  
 Harvey Bingham, do. Waggon Maker.  
 Arden Seymour, Rome, Potter.  
 Nathan Lawton, do. Coach Maker.  
 Thomas Williams, Vernon, Tanner and Currier.

## ONONDAGA COUNTY.

Jacob W. Page, Elbridge, Cabinet and Chair Maker.  
 Charles Rust, Syracuse, Cabinet and Chair Maker.  
 Silas Ames, do. Saddler.  
 J. J. Wood, do. Tailor.  
 J. J. Bradley, do. Blacksmith.  
 Warren Hecox, Skeneateles, Tanner and Cordwainer.  
 John S. Coonley, Jamesville, Carpenter.

## CAYUGA COUNTY.

John Richardson, Auburn, Cabinet Maker.  
 Solomon C. Dunning, do. Tailor.  
 Harvey Moore, do. Tailor.  
 Daniel Hewson, do. Tin Plate Worker.  
 James Snell, do. Tailor.  
 David B. Marvin, do. Cordwainer.  
 J. Litchworth, do. Saddler.

## ONTARIO COUNTY.

Earl D. King, Canandaigua, Cabinet Maker.  
 R. Hogarth, Geneva, Tailor.

## TOMPKINS COUNTY.

Thomas Thompson, Trumansburg, Cabinet Maker.  
 Ira Tillotson, Ithaca, Builder.  
 Edward Mead, do. Watch Maker.  
 Caleb P. Plumb, do. Cordwainer.  
 Almanzer Tufts, do. Tailor.

## WAYNE COUNTY.

Farnham White, Lyons, Chair Maker.  
 Erastus Burt, Newark, Iron Founder.

## MONROE COUNTY.

W. E. Lathrop, Rochester, Saddler.  
 Frederick Starr, do. Cabinet Maker.  
 Bill Colby, do. Chair Maker.

## YATES COUNTY.

Samuel F. Curtis, Penn Yan, Chair Maker.  
 Lewis S. Ayres, do. Hatter.

## ERIE COUNTY.

Abner Cutler, Buffalo, Cabinet Maker.

The following letter from the absent members of the Buffalo Delegation is so much in accordance with the views expressed by members of the Convention from other parts of the State, who were also prevented from attending, that it is deemed proper to publish it by way of



showing that similar sentiments are entertained in every section of the State, even where there has been no interchange of opinion.

BUFFALO, August 18, 1834.

Sir,—At a numerous meeting of the Mechanics of this city, held on the 8th instant, the undersigned were appointed delegates to attend the Convention to be holden at Utica, on the 20th; but owing to circumstances unforeseen, and entirely beyond their control, the delegates, with one or two exceptions, are unable to attend. The cholera, which, within a few days has assumed an alarming character, is raging with a degree of mortality greater than at any former period, calling for the kind sympathies and active exertions of our citizens, in relieving the wants, and in administering to the necessities of the distressed and the dying. No ordinary circumstances would have prevented any member of the delegation from attending.

The mechanics of this city feel a deep interest in the subject of our present State Prison system; they consider it *wrong in principle*, and *ruinous in its results*. They conceive that it does not, in fact, accomplish what has been claimed for it by its advocates, much less what was designed by its founders.

Instead of supporting itself, and bringing a revenue to the State, it in effect levies a most enormous and oppressive tax upon mechanics only, while it exempts all other classes of citizens. Instead of reforming criminals and returning them to society, fit associates for our families, it makes them greater adepts in villainy, and better qualified to impose upon the honest and unsuspecting. It, in fact, makes the accomplished *scoundrels licensed* to go forth and depredate upon community, destined in ninety-eight cases out of one hundred\* to again become tenants of the same, or some other prison.

These are not all the evils of the system; it has a direct tendency to depress the value of labor, and to bring it into disrepute, to the injury of the *many*, for the benefit of the *few*.

If the moral sense of community will tolerate the system as now conducted, a little more refinement of philanthropy may abolish our prison work-shops, and convert them into seminaries of learning, into law schools, medical colleges, and theological institutions, for the benefit of gentlemen convicts.

In view of all the facts we have been able to collect on this subject, we are decidedly of opinion that the whole system is *defective*;

That it is a most oppressive *tax* upon the mechanics of the State;

That it is destructive of the morals of society;

That it has no tendency *whatever* to reform criminals;

That it is a disgrace and stigma upon the mechanics of this State, and *opposed to the spirit of our institutions*; and we believe the subject only needs rightly to be understood by the intelligent people of this State, to meet their decided disapprobation and rebuke.

\* See answer of the Hon. Richard Riker, to questions of the Select Committee, made 1834.

With a view of this object, we pledge ourselves to co-operate with our brother mechanics throughout the State, in taking such measures as shall be recommended by the Convention; and we will most cheerfully perform any duty assigned to us, or either of us, in furtherance of the general object.

E. D. EFNER,  
JOHN W. BEALS,  
WM. KETCHUM,  
A. W. WILGUS.

Absent Members of Buffalo Delegation.

To the President of the Mechanics' Convention, Utica.

[We have obtained much information on the subject of "State Prison Labor:" it will be found at page 148, as well as other interesting facts connected with this subject.—ED. M. M.]

### Apparatus for extracting Caloric by Compression for heating Rooms.

To the Editor of the Mechanics' Magazine:

SIR,—It appears to me most probable that some plan has heretofore been adopted, or proposed, for extracting caloric by compression for heating rooms, &c. I can only say that I have no knowledge of any instance of the kind, nor have I made any experiments on the subject, except on a very small scale, which however have been very satisfactory. I intend, soon as convenient, to construct an apparatus of the following description:

A cylinder six feet long and six inches in diameter, with a permanent partition or cylinder-head in the middle, dividing the interior into two equal parts. In each part of the cylinder is a piston with packing and piston rod, with cross-head and guides, as is usual in steam engines. The two cross-heads are connected with each other by two rods, which extend from the two ends of one cross-head to those of the other, and of such a length that when one piston approaches the centre-head, the other recedes to the opposite end of the cylinder. On one side of the cylinder, and near the centre-head, is a branch, and within the branch a puppet valve, which admits the induction of air, but prevents its escape. On the other side, opposite the first, is a second branch and valve, which permits the air to escape from the first section of the cylinder, but prevents its return. These valves are drawn to their respective seats by spiral springs. Near the second branch, but communicating with the other section of the cylinder, is a third branch, with a cock-valve. From the head of this valve a crank or lever projects horizontally about three inches towards the cylinder. To the end of this lever is attached, by a revit or moveable joint, a rod, which

extends to the end of the cylinder, having a hook or catch near the end, which takes to the second cross-head, whenever the second piston is brought forward to the centre-head; and is thereby, when the piston recedes, carried about three inches, thus opening the valve, and is then detached from the cross-head by means of an inclined projection on the lower side of the rod coming in contact with a pin, which for this purpose projects from the end of the cylinder, and the valve is then instantly closed by a spring. Opposite the third branch is a fourth, with cock-valve, lever, and rod; this rod also extends to the end of the cylinder, and the end being bent backward comes within; so that when the second piston approaches the end of the cylinder, it comes in contact with the bent end of the rod, moves it two or three inches, and thus opens the valve: the rod is again brought back to its first position, thus closing the valve by the approach of the cross-head.

To the first branch is attached a pipe, which conducts air to the first section of the cylinder from without: to the second is attached a pipe, which receives the compressed air from the cylinder. This pipe communicates with another, being connected by a flanch or other joint, and having a valve near the joint, which admits the compressed air to the second pipe, but prevents its return. In the same manner the second pipe communicates with a third, and that with a fourth, the order thus extending through any number of pipes, of any convenient dimensions, and any variety of positions, with joints and valves. These are called heating pipes, the last of which communicates with the second section of the cylinder by the third branch. Another pipe is attached to the fourth branch, which conducts the liberated air out of the room.

These pistons are put in motion by wind, water, or other power, the third valve being kept closed, and the fourth being kept open, (which may be done by raising the two rods connected with these valves a little out of their usual positions,) till the air within the heating pipes becomes compressed equal to about twelve atmospheres, when the two rods, being returned to their places, are put in operation. By this arrangement it will be understood that the pistons, being connected, and the expansive force of a portion of the compressed air being applied to the piston, it contributes much, if not most, of the power required for compressing it. Note—In the foregoing description, the cylinder is supposed to be fixed in a horizontal position, but may be either horizontal or vertical, as may be most convenient.

I have not yet had opportunity of ascertaining by experiment what quantity of heat may be thus obtained; but I think I may safely calculate, that about three-fourths of the caloric contained in the air thus compressed will be evolved during its progress through the heating pipes; and that the atmosphere contains at least one hundred degrees of caloric when at the temperature of zero: therefore, if the piston makes one hundred vibrations per minute, and compresses at each one cubic foot of air, it follows that the temperature of the air contained in a room ten feet square may be raised seventy-five degrees in ten minutes; or twenty-four rooms may be kept comfortably warm in the coldest weather. The liberated air must not be permitted to escape within the room, as it will be intensely cold, and might be employed to advantage in the preparation of ices, or in cooling apartments in warm weather.

Yours, very respectfully,

RUFUS PORTER.

Billerica, Mass., Aug. 16, 1834.

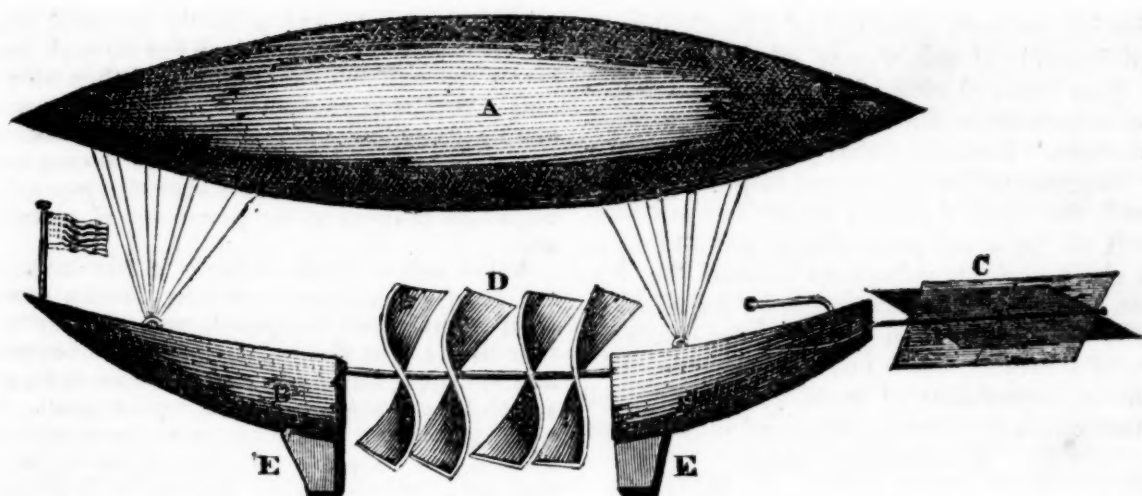
#### *Aeronautic Steam Car.*

To the Editor of the *Mechanics' Magazine*:

SIR,—Herewith I send you a proposed plan for an *Aeronautic Steam Car*, which, if you deem worthy of your attention, you may record in your *Register of Inventions and Improvements*. Of the expediency of the project, your readers and yourself must be the judges. For my own part I should not have thrust it upon your attention had I the slightest thought of its inexpediency. I am of the opinion that, if properly constructed, it will succeed beyond a doubt in calm weather. Of the effect that would be produced, should *Æolus* unpack his chariot during one of its aerial flights, I am unable to speak; but I presume the tempest-tossed voyager would be able to conduct his frail bark with as much skill certainly as our modern aeronauts, who are limited in their operations to a discharge of gas and ballast. The plan herein proposed occurred to me some years since, but I have not availed myself of the advantages that arise from an actual experiment, because of the expense which must necessarily be incurred in the construction of such a machine.

The sketch represents a side view of the car. A is a balloon; B, the car attached thereto; C, a helm to govern its course; D, spiral vanes; E, supports for the car when at rest. Let two balloons, of the form represented in the drawing, be made of silk, prepared in the usual manner, both of the same size. A silk netting is thrown over each one, but is collected into a few cords





at a short distance from each extremity of the balloon. The balloons being placed horizontally and parallel with each other, a car is suspended a few feet below, in the manner represented in the sketch, being attached at four points. The car may be made of any desirable form, of some material combining in an eminent degree strength and lightness. A light frame of wicker-work covered with oiled silk might answer the purpose. The car contains,

1. A simple apparatus for generating hydrogen gas, suitably connected with the balloons by pipes. Valves are also provided for the intromission and eduction of the gas at the disposal of the æronaut. If it is required to ascend, a greater quantity of gas is introduced, the balloons being constructed so as to admit of it. A contrary process causes a descent. The usual way of effecting a rise by throwing out ballast is therefore wholly avoided, and the car is not encumbered by unnecessary baggage.

2. A small steam engine of the simplest construction, with gearing to move the silken vanes or wings, of a spiral form, which are placed on both sides of the car. The boiler may be heated by the combustion of water in combination with bituminous or oleaginous substances, on the principle of "Moorey's American Water-Burner."

3. A helm of silk stretched on rods placed in the stern, to govern the motions of the whole. This may be made after the manner represented in the drawing, where two fans are joined together at right angles with each other, (its action on the air will readily be perceived,) or by two distinct fans, placed so as to act vertically or laterally.

4. A barometer, thermometer, compass, and the whole et cetera necessary for an aerial voyage.

Let us now suppose the balloons to be inflated, and the whole with one person buoy-

ant in the air, the balloons being of sufficient capacity to sustain the whole. Gas is now introduced till it rises. When a sufficient height is attained let the silken vanes be caused to revolve with rapidity. A *rapid progressive motion* is the result. Should any of your readers think differently, or should they discover any difficulty, theoretical or practical, they will please make it known through your columns, that I may avail myself of the same medium (with your permission) to correct, acknowledge, or explain, as the case may be, as I hold myself in readiness to answer all queries respecting the above, if possible; and I am equally ready to confess my error, if it shall be clearly shown. Its practicability rests upon the truth of two points: 1. Can balloons be constructed of sufficient buoyancy to support a car containing the above described apparatus? 2. If supported, will a progressive motion be caused by the action of the spiral vanes on the air? When we reflect that balloons have been made capable of raising four persons, and that the apparatus cannot exceed the weight of two persons, the truth of the first of these propositions becomes sufficiently apparent. That the air is a sufficient abutment to cause progressive motion, if acted upon properly, is exemplified in the flight of birds, where muscular action is exerted to acquire and maintain a height, as well as to move forwards. The words of poetry as quoted in your last will be strictly verified:

"Soon shall thy arm, unconquered steam! afar  
Drag the slow barge, or drive the rapid car;  
Or, on wide moving wings, expanded, bear  
The flying chariots through the fields of air."

In conclusion, Mr. Editor, I would beg you to overlook the many errors that must occur in this article. "I am no orator, as Brutus is," and am equally unskilled in "chaining winged thoughts to the parchment." At some future time I purpose to

furnish you with drawings of a newly invented Portable Horse Power which I possess. I have other objects in view besides a desire to contribute to the advancement of mechanic arts. I consider that yours is indeed a "Register of Inventions and Improvements," and, therefore, a person unable to avail himself of the usual protection by patent may in a great measure secure to himself the *credit*, at least, of his invention by publication. The world may then judge of the originality of a project, and a fair copy be present for the *accommodation* of those who would avail themselves of the *advantages* of *re-invention*.

Respectfully, yours,

B. G. N.

Dexter, Mich. Ter., August, 1834.

**PLANARIAE.**—On January the 27th, at the Royal Institution, Mr. Faraday proceeded to lay before the literati assembled, an account of Dr. R. Johnson's investigations into the *restorative*, *productive*, and *reproductive* powers of the Planariæ, a genus of small animals allied to the leech, and of which there are several known species, viz., *P. torva*, *lactea*, *hastata*, *arethusa*, *felina*, &c., the three first of which are to be found abundantly in a pond near the Red-House, Battersea Fields.

From Dr. Johnson's experiments, it appears that if an incision be made longitudinally into the head of the animal, so as to separate its eyes from each other, if the cut has not been carried very far down, it will heal in the ordinary manner; but if the head be absolutely cleft in twain, then, according to the extent of the fissure, there will be a mass of new matter formed by each half of the head, which will either join the two halves together, forming a head of extraordinary size, and bearing in it one or two additional eyes, or each old half, thus cleft, will form the new matter into another half, with an eye, and so the animal have two complete and entire heads. If the fissure be farther down through the body of the animal, then not only will there be two heads, but two bodies also formed, joined together only by the tail; and when this is the case, so little unanimity does there exist between these *siamoid* twin-planariæ, that they never pull or swim the same way; and so violent are their efforts, that they frequently, in the course of two or three days, tear the only remaining bond of union, their tail, in sunder, and then two distinct and perfect animals result.

If in a common planaria the head be cut entirely off, a new head will be formed; and if its lower extremity be removed, it will produce a new tail. In a planaria, which, by the operation above described, had been invested with two heads, these "nova capita" were successively severed for three several generations, and

were immediately and perfectly renewed, and subsequently the animal was cut through just below the artificial bifurcation, and then only a single head was produced, so that in this more simple "capital" operation, a single headed animal became a biceps, and, after having had the use of six heads in succession, was subsequently reduced to the possession of a single one.

When one of these animals is cut in half, the head, or anterior extremity, swims away as if nothing had happened, and speedily re-tails itself; but the tail swims to the bottom, and remains torpid for two or three days, by which time it has formed for itself a head. If a planaria be cut into three pieces, the head will form a new body and tail, the tail a new body and head, and the middle section or body will produce both head and tail. If a quarter be removed by making a longitudinal incision through the head, and half down the body, and then a semi-transverse cut to remove the upper quarter, not only will the three remaining quarters speedily re-produce a new fourth, but also the separated fourth will form to itself three new quarters. Indeed, a planaria has been cut into as many as ten pieces, and each piece has become an entire and perfect animal. In fact, this mode of propagation, which physiologists artificially institute, seems to be frequently resorted to by the animal itself. The planaria *felina* has been seen to throw off pieces of its body, to form new animals, and these are not diseased but healthy parts, and not only parts of its tail, but often offsets from its sides, &c. Indeed, the planaria *felina*, and *p. arethusa*, have been never known to lay eggs, whilst the *torva*, *lactea*, &c. lay them in abundance, both the original animals and those artificially produced. It would seem that those species which inhabit springs and running waters, propagate only by division; but those which dwell in ponds and ditches, where the water is occasionally exhausted, are oviparous, as well as viviparous.

The above facts are physiologically curious, as they show a still closer affinity than had been previously supposed to exist between the propagation of plants and animals by cuttings as well as seeds; for they have shown that this mode of propagation can be carried to an almost equal extent in the one as in the other—an extent to which the experiments of Trembley, and others, on polypi, star fish, &c., did not reach.—[Medical and Surgical Journal.]

**INTERCOURSE WITH THE WORLD.**—Increasing our connections with mankind is like an extended line of an army, vulnerable at many points, and liable to be broken and discomfited. If we concentrate and incastellate our forces, we may, indeed, remain undisturbed, and we may also lose all in a coup-de-main. Alas! how dark is the ken of human foresight.

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